



South Carolina Department of Health  
and Environmental Control

# GUIDANCE DOCUMENT: TIER I ASSESSMENT

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## TIER I ASSESSMENT

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TIER I ASSESSMENT REPORT format

## **TIER I ASSESSMENT**

- I. **Purpose** - This guidance document outlines the scope of work for a Tier I Assessment. The Tier I Assessment shall be conducted at sites where a release of petroleum from a regulated underground storage tank (UST) has been confirmed and additional information is necessary to further categorize the release. The objective of this standardized scope of work is the completion of a Tier 1 Risk-Based Corrective Action ([RBCA](#)) evaluation and site classification. This document details the specific tasks required to complete the Tier I Assessment. These specifications do not include general implied tasks as required by Federal, State or local governments (OSHA 40 hour training, Health and Safety Plans, business licenses, etc.).
- II. **Standard** - All site rehabilitation activities must be conducted by a South Carolina Department of Health and Environmental Control ([SCDHEC](#)) certified site rehabilitation contractor as required by the State Underground Petroleum Environmental Response Bank ([SUPERB](#)) Site Rehabilitation and Fund Access Regulations R.61-98. All site rehabilitation activities related to a release from an UST require prior technical approval by the Department in accordance with state and federal directives. In addition to technical approval, preapproval of all costs is required for payment from the SUPERB Account. Once any SUPERB deductible is met, the Department can directly procure the services of a site rehabilitation contractor for the UST owner or operator upon their request under the state lead option.

The Tier I Assessment is a standardized scope of work; therefore, a work plan shall not be submitted to the Department. Upon receiving approval from the Department for implementation the Tier I Assessment, the work should be completed at the designated site within 60 days from the date of approval or at a time designated by the Department.

### **III. Receptor - Utilities Survey / Site Survey**

- A. To successfully complete the receptor and utility surveys, the contractor shall:
  1. Locate all private and public water wells (drinking and non-drinking) and other potential receptors (as defined in the RBCA Guidance Document [e.g., utilities, surface waters, wetlands, basements]) within a 1,000-foot radius of the site. Document the locations in the attached Tier I Assessment Report and accurately depict the locations on a United States Geological Survey (USGS) 7.5-minute topographic map (Figure 1 of the Tier I Report).
  2. Record the current use (residential, commercial, agricultural, industrial) of the site and adjacent land. The report shall include a summary of all zoning regulations concerning the installation of drinking and/or irrigation wells or land use. If no zoning regulations exist, the nearest property boundaries within 1000 feet of the UST shall be identified. In addition, the names and phone

numbers of any persons that have provided information pertaining to land use or zoning ordinances, statutes, and/or regulations shall be provided. This information should be provided as Appendix F to the Tier I Report.

3. The contractor must obtain a copy of the applicable portion of a tax map. This map shall depict the location of the facility, the release area, and all properties located adjacent to the impacted areas including active and former gas stations with permit numbers (if available). The tax map and the names and addresses of the owners of each of the properties must be provided as Appendix G of the Tier I Report.
4. Locate and report all underground utilities (electrical, natural gas, telephone, water, cable TV, storm drain, and sewer lines) within a 250-foot radius of the UST facility boundaries to the nearest one foot horizontally and obtain the depth to the nearest two feet. Depict all identified underground utilities, both on and within 250 feet radius of the facility, on a surveyed map.

After Completion of Soil Boring and Monitoring Well Installation, a survey of the UST facility shall be produced by a South Carolina Licensed Professional Land Surveyor. The survey shall include, at a minimum, all of the following:

1. The location of all manmade structures;
  2. All above ground and underground utilities;
  3. All potential receptors on site;
  4. All existing and/or former USTs and associated piping and dispensers; and
  5. All monitoring wells within the survey area.
- B. If receptors are identified that may be impacted, immediately screen for hydrocarbons using a properly calibrated organic vapor analyzer, or other similar screening device. Water samples shall be obtained for all water supply wells within a 500-foot radius of the site. If field-screening indicates the presence of hydrocarbons, notify the [UST project manager](#) within 48 hours of detection at (803) 896-6241 and provide the name, address, and a contact telephone number for all associated property owners. All field-screening and laboratory data for these receptors shall be included in the report.

#### IV. Soil Boring Installation, Sampling, and Analyses.

- A. Install eight soil borings in the locations described below and collect enough soil samples to perform all required analyses.
1. UST Area: Install two soil borings to a depth of 25 feet or to the groundwater table, whichever is shallower, in the area formerly occupied by the USTs or adjacent to the currently operating USTs. Soil samples shall be collected at five-foot intervals to the boring terminus. **DO NOT COLLECT SOIL SAMPLES BELOW THE WATER TABLE.**
  2. Piping and Dispenser Area: Install five borings to a depth of ten feet or to the groundwater table, whichever is shallower, in the area formerly occupied by the lines and product dispensers or adjacent to the currently operating product lines and dispensers. Soil samples shall be collected at two-foot intervals to the boring terminus. **DO NOT COLLECT SOIL SAMPLES BELOW THE WATER TABLE.**
  3. Background Soil Boring: Install one soil boring to a depth of 10 feet or to the groundwater table, whichever is shallower, at least thirty feet away from any USTs, product lines, dispensers, and other potential sources of chemicals of concern (CoC). If the site is too small to allow a separation of thirty feet, install this soil boring as far away from all USTs, product lines, dispensers, and other potential sources of CoC as possible. Collect a soil sample from below the "A" horizon unless precluded by a shallow water table. **DO NOT COLLECT SOIL SAMPLE BELOW THE WATER TABLE.**
- B. Describe the lithology for each soil sample collected during boring installation and screen for organic vapors utilizing properly calibrated instruments. The method of field screening to be utilized is at the discretion of the contractor and shall be included in the Standard Operating Procedures section of the report. Any technology, which accomplishes the Tier I Assessment performance standards and meets all regulatory requirements, is acceptable.
- On a separate Geologist's log for each boring, record the soil type, color of soil using standard methods, rocks or minerals present, split-spoon sample intervals, and any field-screening measurements. Additionally, a qualitative indication of soil conditions (dry, moist, wet, saturated) shall be noted on the logs. The Geologist's logs shall note the depth of each sample submitted for analysis. The Geologist's log shall include the name and signature of the person collecting the data. Enclose the logs as Appendix A to the report.
- C. One soil sample from each boring around the USTs, piping and dispensers shall be submitted to a SCDHEC certified laboratory for analysis of benzene, toluene, ethylbenzene, and xylenes (BTEX), MTBE,

naphthalene, PAHs, and total lead. Samples from sites with a waste oil release shall also be analyzed for the 8 RCRA metals (lead, mercury, arsenic, barium, cadmium, chromium, selenium, and silver). Refer to [Analytical Methodology for Groundwater and Soil Assessment Guidelines](#) for collection and preservation methods.

1. The soil sample with the highest field-screening measurement from each boring shall be submitted for the appropriate analyses. If the concentrations for all samples in a boring are within ten percent of each other, the sample from the greatest depth in the vadose zone shall be submitted for analysis. The Geologist's logs should note the location, depth, and type of each sample submitted for analysis.
2. Field sampling logs, chain of custody forms, certificates of analysis, and the lab certification number will be added to the report as Appendix C.
3. Two additional soil samples from the soil boring with the sample exhibiting the highest field-screening results will be submitted to a SCDHEC-certified laboratory for analysis as follows:
  - a. One soil sample shall be submitted for a grain size/hydrometer analysis to determine the sand, silt and clay fractions at 0.074 millimeters (#200 screen) and 0.004 millimeters respectively. The Geologist's logs shall note the location, depth, and type of each sample submitted for analysis. The laboratory reports should be included with other analytical results in the report.
  - b. The second sample shall be analyzed for Total Petroleum Hydrocarbons using Environmental Protection Agency ([EPA](#)) method 3550. The Geologist's logs shall note the location, depth, and type of each sample submitted for analysis. The chain of custody forms, certificates of analysis, and the laboratory certification number should be included with other analytical results.
4. The soil sample collected from the background soil boring shall be analyzed for total organic carbon, the location, depth, and the type of the sample noted on the sampling log. The chain of custody and laboratory reports shall be included with other analytical results in Appendix C. The total organic carbon value should be recorded in the Tier I Report. The details of the boring will be included in Appendix A with the other soil borings.

## **V. Soil Boring Abandonment**

Two soil borings shall each be converted to permanent monitoring wells as described below in Section VI: 1) the boring producing the soil sample exhibiting the highest field-screening results, and 2) the background boring. All other soil borings must be properly abandoned as regulated by the South Carolina Department of Labor, Licensing and Regulation ([LLR](#)) and in compliance with South Carolina Well Standards, [R.61-71](#).

## **VI. Monitoring Well Installation, Sampling, and Analysis**

- A. A total of three two-inch, PVC-casing wells, with ten-foot screens bracketing the water table shall be installed. The wells must be installed as regulated by the SCLLR and be constructed in compliance with South Carolina Well Standards, R.61-71. Each well shall require proper filter pack, grout, locking well cap, well pad at or above the land surface, data plate, and a cover held in place with bolts or screws.

The locations of the wells are as follows:

1. Monitor well MW-1 shall be installed in the immediate location of the soil boring that exhibited the highest field-screening concentration.
2. Monitoring well MW-2 shall be installed in the location of the background soil boring.
3. Monitoring well MW-3 shall be installed in a position on the site so that the direction of groundwater flow can be determined. This well may not be constructed in a location of a previous boring.

During well installation, soil samples are to be collected for screening at five-foot intervals using a split-spoon, or other discrete-interval, sampler. The soil lithology of each sample is to be recorded on a geologist's log. The log shall contain the soil type, color of soil using standard methods, rocks or minerals present, split-spoon sample intervals, and any organic vapor and field-screening measurements. Additionally, a qualitative indication of soil conditions (dry, moist, wet, saturated) shall be noted on the log. The Geologist's logs should note the location, depth, and type of each sample submitted for analysis. The Geologist's log is included in Appendix A of the report. The monitor well construction logs and DHEC Form 1903 (Water Well Record) will be included in Appendix B. The soil sample exhibiting the highest concentration of CoC from each borehole shall be submitted for laboratory analysis as listed above in Section IV C.

If screening levels for all samples are within ten percent, then the deepest sample (**ABOVE THE VADOSE ZONE**) shall be submitted for analysis. The chain of custody and laboratory reports should be included with other analytical results in Appendix C.

All soil and groundwater with indications of containing petroleum chemicals by screening methods during boring construction and monitoring well development/purging shall be stored in 55-gallon drums or equivalent containers. Upon receipt of laboratory analytical results, the wastewater and soil shall be disposed. If levels of contaminants are below laboratory detection limits, contact the UST project manager for permission to dispose of the wastes on-site. Copies of certificates of disposal will be included in Appendix E.

After well installation:

1. All wells must be properly developed (in compliance with South Carolina Well Standards, R.61-71. The method of development is at the discretion of the contractor. Development will be considered complete once enough solids, drilling muds and fluids have been removed to provide relatively sediment-free groundwater samples that are typical of the shallow aquifer.
  2. Survey the elevation of the Top of Well Casing (TOC) for each well relative to an established datum on site. The datum point shall be identified in the Report and its location marked on the site map.
  3. The static water level shall be measured after the well is developed and allowed to equilibrate for a minimum of six hours. If free product is present, the thickness of the free product shall be measured and recorded. The distance from the TOC to the groundwater table and/or free product shall be measured to the nearest 0.01 foot and recorded.
  4. The collection of a groundwater sample is not necessary if free product in the well exceeds 0.01 foot (1/8 inch).
- B. Groundwater samples should be collected after the wells have been developed and allowed to equilibrate for a minimum of six hours. All new wells are purged prior to first sampling.

The wells shall be purged prior to sampling. During purging, indicator parameters of pH, temperature, dissolved oxygen and specific conductance shall be monitored and recorded. Purging is considered complete once the groundwater temperature and pH measurements have equilibrated. Field data sheets documenting purging volumes and measured parameters shall be included as an attachment to the report of findings.



The groundwater samples shall be submitted to an SCDHEC-certified laboratory for analyses of BTEX, Naphthalene, MtBE, PAHs, Lead, EDB, 1,2 DCA, TPH, Dissolved Oxygen and Carbon Dioxide, Ferrous Iron, Nitrates, Sulfate, Methane and in the case of waste oil tanks, for 8 RCRA metals as well. All industry standard quality assurance and quality control methods shall be followed for shipping (sample labels, sealed sample containers, completed chain of custody forms, shipment to the laboratory on ice). Refer to [Analytical Methodology for Groundwater and Soil Assessment Guidelines](#) for collection and preservation methods and analytical parameters required.

Sample any other monitoring wells that exist on site (e.g., Initial Groundwater Assessment Monitoring well). Purging is not necessary before a sample is collected from previously sampled monitoring wells, unless the well screen does not bracket the water table.

## **VII. Aquifer Evaluation**

Two separate aquifer slug tests shall be completed from different monitoring wells located outside of the UST area to determine aquifer characteristics. Data shall be collected, evaluated, and analyzed in accordance with industry standards (Horslev, Bower and Rice, etc.). The slug test shall be reported in the format as shown at [www.scdhec.gov/eqc/lwm/forms/slugtest.pdf](http://www.scdhec.gov/eqc/lwm/forms/slugtest.pdf). The completed forms shall be attached to the report as Appendix D.

## **VIII. Tier 1 Risk Evaluation**

The Tier I Assessment evaluates the actual and/or potential impact to receptors. Based on the data gathered from the fieldwork, a Tier 1 Risk Evaluation shall be completed. More detailed information may be found in South Carolina Risk-Based Corrective Action for Petroleum Releases (RBCA Guidance Document).

- A. Comparison with Risk Based Screening Levels (RBSL) - For a Tier 1 Risk Evaluation, it is assumed that all exposure points are located in the source area. CoC concentrations shall be compared with the values provided in the RBSL Look-Up Tables of the RBCA Guidance Document, as appropriate.

The following measurements of representative concentrations of CoC are to be utilized in this comparison:

1. Air - The maximum CoC vapor concentration obtained during the last sampling event shall be used. Historical sampling events can be used to establish trends.
2. Groundwater - The maximum CoC concentration obtained during the last sampling event shall be used. Historical sampling events can be used to establish trends.

3. Soil - The maximum CoC concentration obtained during the last sampling event shall be used for the ingestion and dermal contact pathways. For the soil leaching to groundwater pathway, the average of the two soil sample results with the highest concentrations from each source area shall be used.
- B. Site Conceptual Exposure Model - The site conceptual model shall identify all complete exposure pathways. Information required to develop this model includes:
1. Release information - Pertinent release information may include, but is not limited to, the historical use of the property where the release occurred, the approximate age of the release, and the properties of the CoC (e.g., solubility, volatility) that were released.
  2. Characteristics of the site - Pertinent site characteristics may include, but are not limited to, the soil type, depth to groundwater, hydraulic gradient, groundwater flow direction, seepage velocity, and the physical distribution of CoC around the source.
  3. Proximity of potential receptors and their construction - The construction specifications (e.g., depth, diameter, and material of construction of a storm sewer) of all potential receptors shall be identified.
  4. Current land use of all affected properties - For each property that is impacted, may potentially become impacted, or is adjacent to a potentially impacted property, the current land use shall be identified (e.g., vacant lot, restaurant, school, residence, factory), and tax map submitted as part of the report.
  5. Applicable zoning or land use ordinances - The local city or county administrative authorities shall be contacted for information pertaining to any applicable zoning and land use ordinances. Zoning ordinances set broad-scale restrictions on property development such as residential, commercial, or industrial. Land use ordinances may establish smaller scale restrictions such as disallowing the installation of drinking water or irrigation wells. A photocopy of the applicable sections or summary of the ordinances shall be provided. If a copy cannot be obtained, name, phone number, and business address of the appropriate authorities shall be provided with the relevant information.

- C. Based on the estimated age of the release, known distribution of the CoC, and the potential for migration, all complete and potential exposure pathways shall be identified and summarized for land use (current and future conditions). The following potential exposure pathways shall be considered for evaluation:

1. Air	<ul style="list-style-type: none"><li>- Inhalation of ambient vapors (particulate or volatile)</li><li>- Explosive hazard</li></ul>
2. Surface Water	<ul style="list-style-type: none"><li>- Ingestion</li><li>- Dermal contact</li><li>- Volatile inhalation (enclosed space and outdoor)</li></ul>
3. Groundwater	<ul style="list-style-type: none"><li>- Ingestion</li><li>- Dermal contact</li><li>- Volatile inhalation (enclosed space and outdoor)</li></ul>
4. Surficial Soil	<ul style="list-style-type: none"><li>- Ingestion</li><li>- Dermal contact</li><li>- Volatile inhalation (particulate or volatile)</li></ul>
5. Subsurface Soil	<ul style="list-style-type: none"><li>- Ingestion (during excavation)</li><li>- Dermal contact (during excavation)</li><li>- Volatile inhalation (particulate or volatile)</li><li>- Leaching to groundwater</li></ul>

- D. Identify Data Requirements - Identify the data necessary to characterize the migration potential, and to quantify the potential impact, for each complete, or potentially complete, exposure pathway identified in the site conceptual model above. Enter all identified data requirements in the table in the Tier 1 Report.
- E. Recommendations for Further Action - Utilizing the information above, a recommendation for the next appropriate action shall be made by the contractor submitting the report.

## IX. Report

The format for the Tier I Report is included in this document and can be found on the UST Program web page ([www.scdhec.gov/egc/lwm/forms/tierone.pdf](http://www.scdhec.gov/egc/lwm/forms/tierone.pdf)). All sections of the Tier I Assessment Report shall be completed. The report shall be reviewed and signed by a qualified SC registered professional engineer or professional geologist associated with a DHEC certified UST Site Rehabilitation Contractor.

### A. Map Preparations

Figure 1 – Topographic Map: Prepare a copy of the relevant portion of the appropriate United States Geological Survey 7.5 minute topographic map. Indicate the location of the site and the location of any receptors (e.g., marsh, groundwater well, city water well, etc.). The figure will be captioned with the facility name and address, UST Permit number, date, and bar scale. The map must include a north arrow. Label as Figure 1.

Figure 2 – Scaled Site Location Map: Prepare a scaled site location map. Indicate the location of the site and of any receptors (e.g., marsh, groundwater well, city water well, etc.) within 500-foot radius of the UST facility. The figure will be captioned with the facility name and address, UST Permit number, date, and bar scale. The map must include a north arrow. Label the map as Figure 2.

Figure 3 - Surveyed Site Map: Prepare a surveyed base map to scale and plot all the utilities. All items should be plotted to an accuracy of 1-foot. The base map also should include:

- a. Location of property lines
- b. Streets and highways (indicating names)
- c. Location of buildings
- d. Paved areas on or adjacent to site
- e. Location of all present and former above ground and underground storage tanks and associated lines, pumps, and dispensers
- f. Underground utilities on or adjacent to site (sewer, water, gas, telephone, electric, etc.)
- g. Location of any other potential receptors
- h. Eight soil boring locations
- i. Three monitoring well locations
- j. Survey datum location.

The base map will be captioned with the facility name and address, UST Permit number, date, and bar scale. The map must include a north arrow. Make copies of this map for use as specified below. Label the map as Figure 3.

Figure 4 – Soil CoC Map: Using a copy of the base map, prepare a soil CoC map by showing soil boring locations and the accompanying soil data. The analytical data should be plotted adjacent to each soil boring (SB) using the following format:

SB-Number  
Sample Depth (feet)  
Benzene (mg/kg)  
Toluene (mg/kg)  
Ethylbenzene (mg/kg)  
Xylenes (mg/kg)  
Naphthalene (mg/kg)  
PAHs (mg/kg)

Label the Soil CoC site map as Figure 4.

Figure 5 – Groundwater CoC Map: Using a copy of the base map, prepare a groundwater CoC map by adding all monitoring well locations, potentiometric surface (elevation) data, and accompanying groundwater analytical data. The groundwater analytical data should be plotted adjacent to the monitoring wells (MW) using the following format:

MW-Number  
Benzene ( $\mu\text{g/l}$ )  
Toluene ( $\mu\text{g/l}$ )  
Ethylbenzene ( $\mu\text{g/l}$ )  
Xylenes ( $\mu\text{g/l}$ )  
Naphthalene ( $\mu\text{g/l}$ )  
PAHs ( $\mu\text{g/l}$ )  
Potentiometric elevation

Label the Groundwater CoC site map as Figure 5. Do not show total BTEX concentrations.

## B. Appendices

The following appendices are to be included in the Tier I report:

Appendix A - Geologist's Logs  
Appendix B - Monitor Well Construction Logs  
Appendix C - Chain of Custody and Laboratory Forms  
Appendix D - Slug Test Data  
Appendix E - Soil and Water Disposal Manifests  
Appendix F - Local zoning regulations  
Appendix G - Tax map and names and addresses of adjacent property owners

## **TIER I ASSESSMENT REPORT OF FINDINGS**

### **I. INTRODUCTION**

#### **A. Owner/Operator Information**

Facility name \_\_\_\_\_ UST Permit # \_\_\_\_\_

Name \_\_\_\_\_

Address \_\_\_\_\_

Telephone Number (include area code) \_\_\_\_\_

#### **B. Property Owner Information**

Name (if different from above) \_\_\_\_\_

Address \_\_\_\_\_

Telephone Number (include area code) \_\_\_\_\_

#### **C. Contractor Information**

Name \_\_\_\_\_

SCDHEC Certification # \_\_\_\_\_

Address \_\_\_\_\_

Telephone Number (include area code) \_\_\_\_\_

#### **D. Facility Information**

Address \_\_\_\_\_

Description of Adjacent Land Use (Commercial, residential, rural, etc.) Include documentation (e.g. zoning regulations) as appropriate.

Predicted Future Land Use (include site and adjacent area)

#### **E. Facility History**

Date Release Reported to SCDHEC \_\_\_\_\_

Estimated Quantity of Product Released \_\_\_\_\_

Cause of Release \_\_\_\_\_

UST #	Product	Date Installed	Currently in use (Yes or No)	If not in use, Date Removed
1				
2				
3				
4				
5				
6				
7				

**Other Releases at this site?**                      Yes \_\_\_\_\_                      No \_\_\_\_\_

**If yes, Date Release Reported to SCDHEC** \_\_\_\_\_

**Status of Release** \_\_\_\_\_

**No Further Action Date** \_\_\_\_\_

## II. SITE CHARACTERISTICS

### A. Site Geography

**Describe the topography of the site and surrounding area (slope, vegetation, bodies of water, major land features, etc.)** \_\_\_\_\_

**Mean Elevation of Site** \_\_\_\_\_

**Additional Comments** \_\_\_\_\_

**B. Exposure Analysis**

Describe all potential receptors and preferential pathways within a 1000-foot radius of the site.

Description of Receptor	Distance/Direction from Site

Provide any additional comments necessary to complete the exposure analysis \_\_\_\_\_

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**C. Utilities Survey**

List the utilities on site, and adjacent to the site within a 250-foot radius, that could serve as exposure points or as preferential pathways.

Utility	On-site or Distance/Direction from site	Depth to Utility

**Additional Comments** \_\_\_\_\_

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**D. Site Geology**

Provide a brief description of the regional geology and hydrogeology \_\_\_\_\_

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Provide a brief description of the site-specific geology and stratigraphy \_\_\_\_\_

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### **E. Soil Boring Data**

**Drilling Dates** \_\_\_\_\_

**Provide a brief justification for the location of the soil borings**

**SB-1** \_\_\_\_\_

**SB-2** \_\_\_\_\_

**SB-3** \_\_\_\_\_

**SB-4** \_\_\_\_\_

**SB-5** \_\_\_\_\_

**SB-6** \_\_\_\_\_

**SB-7** \_\_\_\_\_

**SB-8** \_\_\_\_\_

**Standard Operating Procedure for Field-screening:**

**Complete the table below for each soil boring.**

### UST Area Borings –

**Borehole SB-**

**Sampling Date-**

### Sample Depth-

[illegible]

**Borehole SB-****Sampling Date-****Sample Depth-**

Split Spoon Interval (ft.)	Field-screening Results (mg/kg)	Lithology (soil type, color, rocks/ minerals present)	Soil Conditions (dry, moist, etc; petroleum odor)

**Piping and Dispenser Area Borings****Borehole SB-****Sampling Date-****Sample Depth-**

Split Spoon Interval (ft.)	Field-screening Results (mg/kg)	Lithology (soil type, color, rocks/ minerals present)	Soil Conditions (dry, moist, etc; petroleum odor)



**Borehole SB-****Sampling Date-****Sample Depth-**

Split Spoon Interval (ft.)	Field-screening Results (mg/kg)	Lithology (soil type, color, rocks/ minerals present)	Soil Conditions (dry, moist, etc; petroleum odor)

**Background Boring -****Borehole SB-****Sampling Date-****Sample Depth-**

Split Spoon Interval (ft.)	Field-screening Results (mg/kg)	Lithology (soil type, color, rocks/ minerals present)	Soil Conditions (dry, moist, etc; petroleum odor)

Enter the soil analytical data for each soil boring for all COC in the table below and on the following page. Enter the appropriate RBSL for the soil type from Tables 4 through 8 in SCDHEC Risk-Based Corrective Action (RBCA) for Petroleum Releases Guidance Document.

CoC	RBSL	SB-1	SB-2	SB-3	SB-4	SB-5	SB-6	SB-7	SB-8
Benzene									
Toluene									
Ethylbenzene									
Xylenes									
Total BTEX	N/A								
MTBE	N/A								
Naphthalene									
Benzo(a)anthracene									
Benzo(b)fluoranthene									
Benzo(k)fluoranthene									
Chrysene									
Dibenz(a,h)anthracene									
TPH (EPA 3550)	N/A								
TOC (Background boring)	N/A								

Discuss the horizontal and vertical extent of COC in the soil \_\_\_\_\_

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Additional Comments \_\_\_\_\_

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**F. Chemicals of Concern - Groundwater**

Provide well installation information in the table below.

MW #	Installation Date	Development Date	Sampling Date

Enter the soil analytical data for each monitoring well for all CoC in the table below.

CoC	MW-	MW-	MW -	MW -
Depth of sample				
Benzene				
Toluene				
Ethylbenzene				
Xylenes				
Total BTEX				
MTBE				
Naphthalene				
Benzo(a)anthracene				
Benzo(b)flouranthene				
Benzo(k)flouranthene				
Chrysene				
Dibenz(a,h)anthracene				
Lead				
EDB				

Summarize the monitoring well and groundwater data in the table below.

MW #	TOC Elevation (ft)	Screened Interval (ft)	Depth to Water (ft)	Water Table Elev. (ft)

Enter field data measurements (temperature, pH, conductivity) taken during well purging on the form provided. Complete for each well.

Enter dissolved oxygen measurements for each well in the table below.

Monitoring Well #	MW-	MW-	MW-	MW-
Dissolved Oxygen (mg/l)				

Enter the groundwater analytical data for each monitoring well for all CoC in the table below. If free product is present, indicate the measured thickness to the nearest 0.01 feet.

CoC	RBSL (µg/l)	MW-	MW-	MW -	MW -
Free Product Thickness	None				
Benzene	5				
Toluene	1,000				
Ethylbenzene	700				
Xylenes	10,000				
Total BTEX	N/A				
MTBE	40				
Naphthalene	25				
Benzo(a)anthracene	10				
Benzo(b)fluoranthene	10				
Benzo(k)fluoranthene	10				
Chrysene	10				
Dibenz(a,h)anthracene	10				
Ferrous Iron	N/A				
Lead	Site Specific				
EDB	N/A				
Nitrates					
Sulfates	N/A				



Additional Comments \_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_

**G. Aquifer Characteristics**

Hydraulic Conductivity \_\_\_\_\_

Hydraulic Gradient \_\_\_\_\_

Porosity \_\_\_\_\_

Estimated Seepage Velocity \_\_\_\_\_

Complete the slug test form and include in Appendix D of the report. Include all data, graphs, and equations used to derive the aquifer characteristics and hydrologic parameters (hydraulic conductivity, seepage velocity, hydraulic gradient, etc.) in Appendix D.

### III. Tier I Evaluation

**A. CURRENT LAND USE** - Identify any potential receptors or human exposure pathways (e.g. basements, contaminated soils from UST closures, etc.) within a 1000-foot radius for current land use. Complete the table below. Additional sheets may be attached if necessary.

Media (for exposure)	Exposure Route	Pathway Selected for Evaluation? (Yes or No)		Exposure point or Reason for Non-Selection	Data Requirements (IF pathway selected)
Air	Inhalation	Yes	No		
	Explosion Hazard	Yes	No		
Groundwater	Ingestion	Yes	No		
	Dermal Contact	Yes	No		
	Inhalation	Yes	No		
Surface Water	Ingestion	Yes	No		
	Dermal contact	Yes	No		
	Inhalation	Yes	No		
Surficial Soil	Ingestion	Yes	No		
	Dermal contact	Yes	No		
	Inhalation	Yes	No		
	Leaching to Ground-Water	Yes	No		
Subsurface Soil	Ingestion	Yes	No		
	Dermal contact	Yes	No		
	Volatile Inhalation	Yes	No		
	Leaching to Ground-Water	Yes	No		

**B. FUTURE LAND USE - Identify any potential receptors or human exposure pathways (e.g. basements, contaminated soils from UST closures, etc.) within a 1000-foot radius for projected future land use. Complete the table below. Additional sheets may be attached if necessary**

Media (for exposure)	Exposure Route	Pathway Selected for Evaluation? (Yes or No)	Exposure point or Reason for Non-Selection	Data Requirements (IF pathway selected)
Air	Inhalation	Yes      No		
	Explosion Hazard	Yes      No		
Groundwater	Ingestion	Yes      No		
	Dermal Contact	Yes      No		
	Inhalation	Yes      No		
Surface Water	Ingestion	Yes      No		
	Dermal contact	Yes      No		
	Inhalation	Yes      No		
Surficial Soil	Ingestion	Yes      No		
	Dermal contact	Yes      No		
	Inhalation	Yes      No		
	Leaching to Ground-Water	Yes      No		
Subsurface Soil	Ingestion	Yes      No		
	Dermal contact	Yes      No		
	Inhalation	Yes      No		
	Leaching to Ground-Water	Yes      No		

## This image shows a blank sheet of white paper with horizontal ruling lines. The lines are evenly spaced and extend across the width of the page. There are no margins, text, or other markings on the paper.